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An Experimental Study of Total Quality Management Application in Learning Activity: Indonesia's Case Study

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Abstract

Babbar's study (1995) on the application of total quality management (TQM) to educational instruction in US universities has provided the idea for the current experimental study. The purpose of this study is to analyze the effectiveness of TQM implementation in Indonesian higher education educational activities. This study is a causal research that analyzes the effect of independent variable on the dependent variable. It is proposed to find the effect of TQM implementation on the effectiveness of educational activities. The data was collected with experiment methods which involved the researcher to manipulate the variables and observe for the effects. The experimental design that used in the study was a pretest and posttest experimental and control group design, therefore it utilized two group of participants (experimental and control groups). The finding of the study supports the hypothesis that TQM implementation increases the effectiveness of educational activities. TQM implementation as a treatment has a positive effect on the effectiveness of educational activities. Student's evaluation of the effectiveness of educational activities shows the higher score after the treatment.

Keywords: experimental study, TQM, educational activities, Indonesia

1. Introduction

Higher education (HE) program is generally aimed to increase students and graduates' quality and competence through the improvement of learning process. Learning process is not only an activity of knowledge transfer from lecturer to the students, but also an activity that enable students to develop his knowledge personally. Learning is a participation of lecturer and students to form knowledge, to make meaning, to look for the clarity, to have a critical attitude, and to hold justification (Panen et al., 2001).

Learning in HE is a strategy to achieve an individual aim of people who had effort to learn through the formal way. However, reality that was dealt with lecturers and the HE institution in many matters was far from that was hoped. Behavior of students and the lecturers in learning process did not show all the attributes that ought to adhere in individual that would receive the scholar title (Suwardjono, 2006).

The important role of education in an increasingly competitive global environment made the teachers and the administration staff continued with finding for more effective learning activities. The learning activity is an activity that involved people, so as the fundamental managerial concepts like commitment, motivation, participation, and leadership had important roles in determining the process effectiveness of forming and affecting the people (Babbar, 1995). Effective learning is hoped to give high added value for the students. The students did not only understand the lecture contents, but also expected to receive the pleasant learning experiences and later could adopt and operate what they have learned in HE.

The interesting phenomenon about HE graduates in Indonesia is the gap between the graduate's qualification and the condition that is determined by companies that recruiting the prospective manpower. Graduate's capacities and skills are not suitable with the requirement of the companies. This reality is needed a redefinition about the role of education, especially in the higher education. HE management in Indonesia necessarily gazed at the process of higher education as a continuous educational process improvement, that is started with an idea of producing the graduates (output) who has a quality, development of the curriculum, learning process, being responsible to satisfy the user of the HE graduate. Information as feedback gathered from the user of the graduate (external customers) could be developed by creative ideas to redesign the curriculum or improved the higher education process.

How a learning process could be effective? One of the management philosophies is Total Quality Management (TQM). TQM is acknowledged as an effective approach to achieve the increase in quality and achievement in industry (Waldman, 1994). TQM application and acceptance that became wider in many industries pushed the academic institution to begin application of TQM philosophy in the educational context (Taylor, 1991).

The TQM application in the education system which is often acknowledged as TQM in education (TQME) is expected to eliminate or reduce high level gap between HE and the industry in Indonesia. However, in Indonesia, the TQME application in HE should be undertaken on the basis of the understanding and joint responsibility to give priority to HE efficiency and the increase of HE quality and process. TQME application in HE system that was undertaken consistently pushed HE in Indonesia in achieving for very competitive global competition and receive the economical and non-economical benefits.

Babbar (1995) carried out a study about TQM application in educational instruction among the universities in the United States. His research has found that at the end of semester students gave high score in assessment of effectiveness of TQM-oriented learning activities. Lecturer made a learning plan presented in the syllabus that was distributed to the student on the first class of the semester. All the activities were referred to key elements of TQM philosophy that were searching for methods of increasing quality, the involvement of the lecturers and the students, the lecturer's leadership, class culture, and focus on the students as the customers.

Babbar's research (1995) found that TQM application in education would increase effectiveness of learning activity. TQM application in education could be realized in activities of communicating teaching philosophy up-front, communicating lectures philosophy, influencing students by "setting a good example", shaping a climate for excellence and got the students to "stretch" their goals, motivating students through fairness, feedback and encouragement while instilling in them a deep sense of values and commitment, and being sensitive to the many other aspects of the TQM philosophy. In the end of semester, evaluation could be carried out to see the results of TQM application. Evaluation was carried out by asking students about the instructional attributes supported learning climate that could help develop their aim, that were motivation, honesty, feedback, values of ethics, and commitment. TQM-oriented learning activity possibly could be an alternative solution for an effective learning in UPN "Veteran" Yogyakarta (UPN VY). Indonesia. In fact, UPN VY had a department for quality assurance that was Badan Penjaminan Mutu (BPM, *Quality Assurance Department*). The quality assurance program was just launched on September 4, 2006, but there weren't any activity plans that had been implemented. To support quality assurance program, the experimental study about the TQM application in learning activity was carried out. The research was facilitated by the Research Department of UPN VY.

2. The Concept of Modern High Education

HE management system in Indonesia necessarily considered that HE process increased continually, that was started with the existence of ideas of producing the high quality graduate, developing curriculum, learning process, and was ended by responsibility to satisfy user of HE graduate. Information as feedback gathered from the user of the graduate (external customers) could be developed by creative ideas to redesign curriculum or improved further the HE process. The concept of management thinking of the HE system is shown in Figure 1.

Next, there was also a developed model about HE operational management in Indonesia that shown in Figure 2.

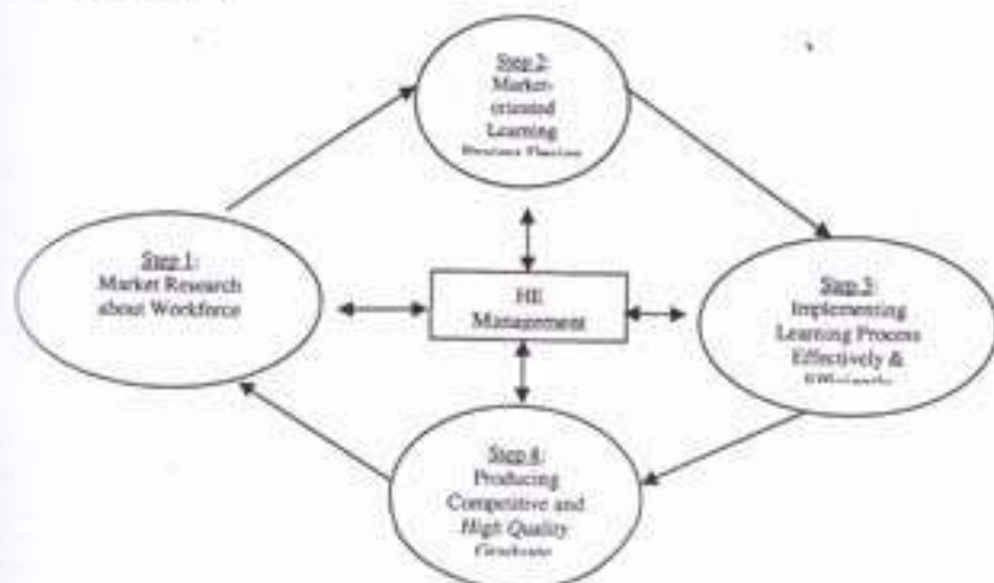


Figure 2. Derring Wheel in Modern HSE Management (Source: Gasparat, 2003)

Application of the Deming wheel in the management of higher education in Indonesia would cover the four main components: manpower market research, design of HE process, operational process of HE, and producing competitive and high quality graduates. In this regard, an interaction was needed between labor market, design of HE learning process, operational process of HE and producing competitive and high quality graduate. This will help HE in Indonesia to compete in the global environment. HE in Indonesia had already carried out reorientation and redefinition of the aim of HE, not only produced the graduate as much as possible without caring about user's satisfaction, but HE might be responsible to produce output that were competitive and with high quality. Consequences of the thinking were that TQM application in HE in Indonesia might be undertaken on the basis of the understanding and responsibility together to give priority to HE efficiency and increase the HE process quality. Through the application of Deming wheel in HE system that was undertaken consistently, HE in Indonesia could win in the global competition and also increase its HE personnel welfare.

3. The Role of Lecturers

Learning is a participation of lecturers and student in knowledge forming, meaning making, clarity searching, being critical, and making justification (Panen et al., 2001). Although the success of a learning process is determined by various factors including curriculum, facilities, lecturer, and student, but the success was controlled by lecturer who played a key role in increasing learning effectiveness, and determination of the learning quality.

Lecturer had responsibility to form student and potential human resources learning that gave contribution to competitiveness in global environment. The lecturer is considered as a leader in education. If in the business had the transformational leader, in HE there is transformational lecturer that could do more than his job description. Task of the lecturer did not only send information and knowledge, but also to mobilize resources, influenced and motivate the student. In this aspect, a TQM-oriented approach could help lecturer to reach all that (Babbar, 1995).

Lecturer had to convince student that they could recognize and accept what was taught, afterwards helped students to transfer them to the real life. The lecturer with the commitment in TQM philosophy could make the student really pay attention to what is taught. The student would think far ahead, that they would need all the knowledge to increase the achievement of their organization in the future, in order to be able to compete. The TQM-oriented learning approach could become a model to improve student learning and provide the best results to both the student and the lecturer (Babbar, 1995).

4. Total Quality Management (TQM)

According to Garvin (1988), quality is an unusually slippery concept, easy to visualize and yet exasperatingly difficult to define. In fact, quality has proved to be a difficult concept to pin down. What is even more surprising is that despite the volume of writing on quality management, there has been only limited attention paid to defining exactly what is meant by the term 'quality' (Wilkinson et al., 1998). TQM is a people-focused management system that aimed at continual increase in customer satisfaction at continually lowering real cost (Bounds, 1994). Ross (1995) looked at TQM as a systems approach to quality that integrates interrelated functions and considers the interaction of

various elements of the organization. According to Spanbauer (1995), TQM is a management philosophy which puts systems and processes in place to meet and exceed the expectations of customers. It was a relentless quest for continuous improvement through documentations and the use of tools in a problem-solving atmosphere that features the team action and good leadership practices. Dahlgaard et al. (1995) defined the total quality in education as the educational culture characterized by existence of increasing customer's satisfaction through continuous improvement, and active participation of lecturers, employees and students.

The appropriate method of starting TQM application is to improve communication and to guarantee each individual to be more comfortable with their work situation. The lecturers and employees might be pushed to bring about supportive situation of continuous improvement. Likewise the decision-makers who are the owner of the educational institution must be able to break the obstacles and aware that their institution would be useful if everyone involved and being empowered. The activities that needed are professional development and strong support. The support from the institution owner can be commitment to implement and support improvement efforts of the total quality. The involvement and commitment are the important matter because TQM is a long term achievement. The lecturers and the employees needed guarantee that the total quality program is continuous. Theories and the TQM concept would be appropriate for HE if all of the sides were sure that the application could be matched with the requirement and anyone was involved in the application and success (Spanbauer, 1995).

5. TQM application to Education

The application of TQM in the education system often that is acknowledged as TQM in education (TQME) and expected to eliminate or reduce the level of high gap between HE and the industry in Indonesia. Gazpersz (2003) wrote that Kemenade and Garre (2000) defined 8 categories that were needed from the HE graduate to comply with the business request and the industry in Belgium, Netherlands, Finlandia, and England, that were: (1) was oriented to the customer, (2) had practical knowledge and the application of TQM equipment, (3) could make the decision based on facts, (4) had the understanding that working was a process, (5) was oriented to the group (teamwork), (6) had the commitment for continuous improvement, (7) active learning, and (8) had a system perspective. In fact there was gap between HE and the requirement for the industry in Indonesia like shown in the Table 1.

Table 1. Graduate's Gap of HE Graduates with the Requirement from Industry in Indonesia

HE Graduates	Requirement from Industry
<ul style="list-style-type: none"> only understood theory had individual skills motivated to pass examination only oriented in certain grade achievement study-oriented only in individual subject separately passive learning process, only accepted information from lecturer used technology separately from learning process 	<ul style="list-style-type: none"> had problem solving ability based on scientific concept had group's skills (teamwork) oriented in continuous improvement, each reached target would be continually improved needed integrated interdisciplinary knowledge for complex problem solving work was interacting process with the other person and processed information actively technology using was integral part of learning process

6. TQM application in HE in Indonesia

Application of TQM to HE in Indonesia might be undertaken on the basis of the understanding and responsibility together to give priority to higher education efficiency and the increase in the quality from the process of the higher education. Through the TQM application in the high education system that was undertaken continually and consistent, then HE in Indonesia could win global competition and received benefit that could be utilized to develop HE and to increase personnel welfare. The efforts would also reduce perceived gap between HE and industry in Indonesia.

It also must be recorded that knowledge applied in the industrial system would become national resources that were most effective to bring the Indonesian nation faced the progress and could compete with other nations in the world. The HE graduate in Indonesia might be supplied also with several additional capacities as co-operating and interacting with other person, communicating, logic-based thinking, problem solving, decision making, comprehensive prospecting, self control and so forth.

7. Defining TQM in a class setting

In business perspective, the most important TQM element was the search for opportunity to increase quality and productivity continually. The concept of total quality improvement means getting every person in a company to evaluate continually and aggressively how every job, every system, and every product can be improved (Bowles, 1985). TQM is based on the participation of all members of an organization in improving processes, products, services, and the culture in which they work (Bernowski, 1992). TQM is a way of doing business that must be instigated by top management and flow as a way of life throughout the organization, to focus on the customer and to strive to improve the product, performance continually and to ensure competitive advantage (Galagan, 1992).

Key elements of the TQM philosophy as contained in the above definitions are: a relentless hunt for ways to improve quality; involvement of all employees; managerial

leadership; corporate culture; and customer focus. These applied just as much to the teaching context as they do to business. The difference lay only in that in the teaching context, "teacher" substitutes for "manager", the "students and teacher" for "employees", "class culture" for "corporate culture", and the "student" for "customer".

Babbar definition about TQM-oriented learning activity was: a philosophy, principles, and practices that guided the lecturer to teach, as learning foundation and the continuous improvement for the student and the lecturer. The application of this procedure is linked to teaching method that could increase education quality for student who would be very useful during present days and future.

TQM in learning activity is adopting a process of total quality approach by the lecturer in learning process, including efforts to increase quality of lectures and learning for the student with various methods so as the student would be ready to enter the industry where they would work. Continuous improvement is always needed by students. According to Babbar (1995), TQM-oriented learning approach covered steps are as follows:

I. *Communicate teaching philosophy up-front*

The course syllabus is used as a vehicle to communicate to students the instructor's TQM-oriented teaching philosophy at the very first day of class. In going beyond the more typical "course objective", a "teaching objective" was also included on the syllabus of every course. A clearly stated teaching objective served as a first step in creating a climate conducive to learning, involvement, and commitment on the part of students as well as the teacher.

II. *Influence students by "setting a good example"*

If those who teach business expect their students to "manage by example" in their future role as professionals and managers then they, as their teachers, might "teach by example". The most fundamental, yet significant, building block of the proposed TQM-oriented approach to teaching is the concept of "influencing by example". As such, a strong and constant undercurrent of "teaching by example" is maintained in whatever the instructor does.

III. *Shape a climate for excellence and get the students to "stretch" their goals*

It is important for educators and students to realize that often their individual potential remained unrealized simply because of the preconceived constraints they impose on themselves. An essential component of the TQM philosophy is the drive for continuous improvement, with no limits placed on what one could accomplish. The more goals were stretched, the greater was the likelihood of attaining higher performance through involvement, participation, commitment, and effort. In keeping with this, students are invariably asked to "stretch" their goals.

IV. *Motivate students through fairness, feedback and encouragement while instilling in them a deep sense of values and commitment*

Feedback is playing an important role in individual behavior and performance (Ashford and Tsui, 1993). Be it positive or negative, it was inherently affective. It played a crucial role in the fostering of goals any TQM-driven effort might aim to achieve, be it in business or in education. Similarly, fairness and encouragement

serve as powerful motivators in any such context. The level to which the teacher is perceived as being fair by the students could exert a strong influence on their level of motivation, involvement and effort. To ensure fairness to the best of his ability, the instructor grades all exams himself (instead of asking the assigned graduate teaching assistant to grade them for him) and always made it a point to go over the exams very carefully during the class session in which they were handed back to the students.

V. Be sensitive to the many other aspects of the TQM philosophy

There are so much more that teachers could do and accomplish by drawing from the broader TQM philosophy and applying it to teaching. Total quality initiatives required a total effort, a can do attitude and, most of all, total involvement. Empowerment, teamwork, reward systems that encouraged continuous improvement efforts while eliminating fear of failure, effective and open communication, and the sharing of common goals are some of the attributes the TQM philosophy encompasses.

8. Condition to apply TQM in HE

Learning process is the centre activity in education and the whole process might be supplemented with various means so as to be able to satisfy students' requirement for preparing them for future. Furtell (1989) stated that the future lecturers are educated in HE, then the TQM application is really needed to improve HE continuously. To increase the quality of higher education, Spanbauer (1995) stated that several concepts of the TQM key and tested the method of applying them in education. Quality gurus (Deming, Juran and Crosby) generally agreed to elements of the TQM foundation shown in Figure 3.

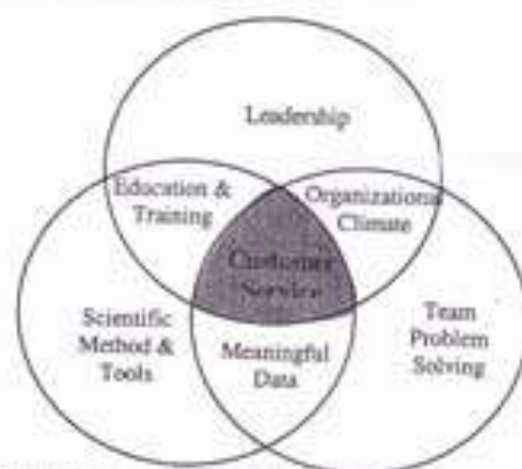


Figure 3. Key Elements of TQM in HE (Source: Spanbauer, 1995)

I. Focus of Customer as First Priority

Quality improvement must be incorporated into all activities of organization with a clear customer focus. Quality management also makes customer satisfaction the number one company priority with emphasis placed in every transaction (Agus and Hassan, 2000). Because 'quality' ultimately involves an understanding and

fulfillment of the requirements of customers, enterprises are now pursuing product and service quality with the aim of satisfying customers (Chow Yang, 2004). Increasingly, manufacturing and service-based organizations are using customer satisfaction as the measure of quality (Eng Eng and Yusof, 2003). Education is the service with the customer like in other business, and the customers revealed satisfaction or dissatisfaction towards the educational service. If TQM is applied in education, it is very important to identify specific requirement for the customer. In other words, quality continuously analyzed as an effort to fulfill customer's hope. Lecturer might learn how quality of education in the past, now and future in order to know what would be needed. To define quality might be asked about what product or service is useful for customers. Customer service helped the organizations to become more specific in delivering their services. The important aims of all is to improve process and system of satisfying customer requirement. Customers are divided into two that were external customer (student, owner of the recruiting company, the community, the tax payer, the lecturer from other HE) and internal customer (other lecturers, administrative staff).

II. Leadership as the ultimate commitment

Visionary leadership and demonstrated commitment must be provided for the TQM process. Top management support is essential to show everyone in campus and the community that the administrative supported the quality improvement initiative. From the previous literature in the TQM field, many researchers have pointed out the importance of top management commitment and leadership for successful quality improvement efforts in the organizations (Ramirez and Loney, 1993; Zairi and Yusof, 1995; Ali, 1997; Ahire et al., 1996; Ahire, 1996; Dayton, 2001; Saraph et al., 1989; Flynn et al., 1994; Thiagarajan, 1996; Rao et al., 1999; Zhang et al., 2000; Pun, 2001; Sureshchandar et al., 2001; Lau and Idris, 2001; Li et al., 2001). Besides this commitment to TQM, it also needed help and the support from the other faculties' management. Good and active communication and involvement from all sides are the best method for made TQM effectively. All of HE members had to realize that their individual success is tied in the work of the team. If the teamwork is successful, the individual would be successful too. Traditional role changed together with the style of new dominant leadership in the TQM organization. In each department, the class and the work unit in the campus would tend to have integrated new view, never just be controlled, and directed.

III. Team problem solving as the foundation of TQM

TQM culture in HE needed teamwork that is also renewed because significant changes would not happen except if lecturers and the other staff that are actively involved in planning and development of the change. The involvement of people who close to customer (lecturer-student, the service worker with the client, et cetera) is the success peak of TQM. Everybody had to be involved in quality improvement by participating in the team.

IV. Scientific methods and tools in process management implementation

Process review needed methods and tools to be used by TQM organization. In problem solving, data and scientific methods guaranteed that the system is designed

carefully and mistake that happened is corrected continually. The aim is to reduce and eliminate the cause of problem forever. There are several tools and techniques that are used in problem solving. Deming has mentioned the seven management tools covered flow-charts, cause-and-effect diagrams, histograms, pareto charts, run charts, scatter diagrams and control charts (Spanbauer, 1995). Several planning implements were also used to formulate the strategic direction and institution's objectives. Evaluation system had to be also carried out continually. The evaluation system assessed the whole organization with institution effectiveness indicator. This standard becomes the benchmark for HE and improvement target that continuously is matched with the dynamic environment to consider customer requirement and arrange the system to fill the customer demand.

V. Meaningful data

Quality had to be specific and is continuously monitored. Therefore, TQM organization needed appropriate data. Unfortunately, there is still HEs using old technology in gathering, processing and presenting the data (Spanbauer, 1995). Usually complex computer system is used to gather the student's data and all the staffs in the organization. The printout results are used to meet government requirements (accreditation/certification, for example), not as an effort to increase quality of information. In TQM environment, the aim of computer using is to gather and distribute data to be used in decision making.

VI. Organizational climate

In TQM organization, people are the most important resources. All they had to do is provide training, tools and support to lecturers and employees in order to attain the mission and objectives. Those efforts would create culture change and education reformation. TQM is a systematic, continuous improvement model that is based on requirement of the external and internal customer. Each educational institution is demanded to become a learning organization (Spanbauer, 1995). In the supportive environment, lecturers and employees would be more involved in the mission and objectives formulation and monitoring. Human resources development (HRD) is hoped to give real contribution to the organization that applying the concept of TQM. But the co-operation and support from each organization member is not easy thing to happen. It needed commitment and patience. Everyone in every level in the organization might realize that teamwork needed continuous communication. A leader who realized the need of culture change would succeed in experiencing cultural transformation (Spanbauer, 1995).

VII. Education and training

Main factor that distinguished TQM organization from the others was focus on individual development. The TQM organization realized that to gain the competitive superiority needed manpower that got learning through continuous training. Individually educated team could evaluate and change the work to be different from other organization. Training underpins TQM determines the likely effectiveness of the quality initiatives undertaken (Mathews et al., 2001 a, b) and investment in education and training is vitally important for quality management success (Zhang et al., 2000; Cebeci and Beskese, 2002). Several recent empirical studies have also

revealed that training and education is a critical factor for the successful quality improvement implementation in organization (Thiagarajan and Zairi, 1997; Quazi and Padibjo, 1998; Yusof and Aspinwall, 2000; Zhang et al., 2000; Black and Porter, 1996; Tamimi, 1998; Pua, 2001; Calisir et al., 2001; Dayton, 2001).

Figure 4 shows the ideal individualized plan with four components: academic and technical training and education, TQM training, specialized TQM training, personal/family development and training. This integrated approach would show that the development of the staff is the main priority.



Figure 4. An individualized professional development plan for TQM organization
(Source: Spanbauer, 2005)

Figure 4 also shows that everyone needed to become competent both academically and technically in his specialization (teaching, managing, service and technical). Without improving specialization, HE would not experience improving quality. The second part to the model showed education in TQM concept, language and technical skills. It guaranteed the process went and connected anyone together to achieve the objectives by continuing to remind the organization commitment against TQM.

The third part, personal/family development and training, focus on individual and family relationship, physical, and emotional. The organization might realize that the physical and mental health of the employee and his family really play an important role for organization welfare by increasing the productivity and better relationship.

9. What was received from the TQM application?

The question above always emerged and needed the answer. But it was not easy to give the exact answer, because results of the TQM application did not happen in a short period. The training needed time and high cost, in fact change would not happen and results would not be achieved without training in the matter of quality concepts, equipment and technique. Results that are achieved often did not happen simultaneously,

depended on leadership in each department. Several leaders possibly could encourage that fast results to be reached, but the other leader possibly needed longer time. It always needed patience in reaching results of this TQM application. The commitment from top management to the lower level is a very important matter. In educational context, the improvement happened if the institution's owner, the lecturer and the employee worked together with other stakeholder to identify the requirement, made the change, measured results and standardized the change that showed positive results. The benefit that is received by each department and results that is gathered while the process of the assessment would cause the improvement just like what they hoped from the beginning. In education, results should be examined in four main areas as outlined in these questions:

- Has learning improved as a result of TQM implementation?
- Is the institution become more efficient?
- Do the graduates leave with TQM competencies?
- Has the culture of the institution changed with a primary focus on the needs of customers?

10. Hypothesis

Hypothesis in this research is: The TQM application would increase the effectiveness of the learning activity in HE.

11. Research Methods

This was the causal research, the research to analyze the influence of independent variables on the dependent variables. This research was expected to find by the influence of the TQM application on learning activity effectiveness in HE. Data collected with experiment technique that involved the researcher in manipulating several variables, observing and measuring the effect. The researcher in the experiment did not only do the grating, but also carried out the intervention to several variables. The treated variable is the independent variable, and the observed variable is the dependent variable (Hartono, 2004). In this research there are 2 (two) variables: that is one independent variable and one dependent variable. Measurements of the variables are as follows,

1. Independent variable: the TQM application in learning activities.

Babbar (1995) said that TQM in learning activity covered elements:

- a) A relentless hunt for ways to improve quality
- b) Involvement of all employees
- c) Managerial leadership
- d) Corporate culture
- e) Customer focus

2. Dependent variable: learning activity effectiveness.

Learning activity effectiveness could be measured with:

- a) *The teacher evaluation (TEVAL)*

TEVAL is the questionnaire distributed to student to evaluate learning activity effectiveness. TEVAL consisted of the following 14 items:

Total Quality Management Application in Learning Activity

- 1). Lecturer's enthusiasm to teach and study something so the student would be motivated to study
- 2). Lecturer's preparation to accept the question and input from the student
- 3). Spirit of the lecturer to teach was balanced with his capacity to transfer knowledge
- 4). Lecturer looked enjoyed the learning activity and tried to teach as well as possible
- 5). Lecturer explained the material very well, the exam could push student to study hard
- 6). Exam and homework really helped the student to understand lecture material, so the student was really impressed to lecturer's capacity
- 7). Lecturer was ready to help student inside and out of the class, so the student could understand lecture material clearly
- 8). Lecturer really understood how ought to become a lecturer, and really cared of student's interests
- 9). Lecturer often asked whether the student understood what he explained, and would explain again if student did not yet understand material
- 10). Lecturer was very accommodating to help the student, and always be prepared to help although out of the class
- 11). Lecturer had good skills in teaching and had quality of a real lecturer
- 12). Lecturer prepared the lecture very well, his knowledge about lecture material was very good and was really interested in the material
- 13). Lecturer pushed the student to think, so the student did not only understand the contents of the lecture, but could develop the understanding for the real problem solving
- 14). Lecturer gave the good example with distributing the task back to the student in the next class

Every item in this instrument is the closed question that needed student's response on five-point rating scale that ranges from "very low rating=1" to "very high rating=5". The TEVAL form also provided the student with space for any additional comments.

b) Educational survey

In attempt to gauge student perception of TQM-based learning activity and to obtain feedback on the specific attributes constituting the approach, an educational survey was also administered to students in each class at semester's end. On this survey the students were asked to rate the instructor on the "kind of example" that he set for them on a number of issues using a scale ranging from "very bad example=-3" to "very good example=+3". Educational survey was the student's assessment and comment about:

- 1). Instructional attributes that helped shape a climate for learning and excellence, and which help get the students to "stretch" their goals

- 2). Instructional attributes that were related to motivation, honesty, feedback, ethical values and commitment
- 3). Instructional attributes that were related to empowerment, the teamwork, reward system, effective and open communication, and discussions about the general objectives

11.1 Experimental Research Procedure

a) The subject selection

The subject was selected using experiment design that was chosen, that was pretest and posttest experimental and control group design. The participants of the study are group of lecturers and this experimental design needed two groups of participants, they were experimental and control group (Sekaran, 2000). All the necessary steps were taken to ensure that the groups are identical in all aspects. As the subject, several lecturers of Management Program in UPNVY entered the experimental group would receive treatment and several lecturers entered the control group. Assignment was done in a random manner in order to control the effect of history, maturation, the testing, and instrumentation. This could happen because everything the experimental group experienced, the control group also experienced the same thing. Randomization also could control bias effect in selection (Sekaran, 2000).

b) TQM training for lecturer

In the first week of beginning of the semester, both the lecturer from 2 groups was gathered to get briefing about this experimental research. Further, the lecturer who became participants of the experimental group would be trained. This training was given as a coaching for their involvement in the experiment and had a purpose that participants could apply TQM in learning activity. The training covered the production of the syllabus and learning method based on TQM. With this training, the lecturers could guide learning activity in a communicative manner and was more open to help student to understand lecture material. Moreover, the lecturers were also hoped to convince the student that lecture material would be very beneficial, even when this student pass and be involved in the actual organization.

c) The experiment

On the first class at the beginning of the semester, lecturers who were involved in this research, both from the experimental and control group, socialized the syllabus just like what they usually did every semester. For the experimental group, this syllabus was drafted for first half of the semester (1st to 7th meeting). However for the control group the syllabus was the whole semester. The control group did not carry out the change in the syllabus, but continued what had been agreed since the beginning of the semester. In second half of the semester, students of the experimental group were given treatment by having TQM-oriented learning syllabus. This syllabus was available for 8th to 14th meeting.

d) Data collection

Data collected twice, that was on the last lecture before the middle exam (7th meeting) and on the last lecture before the final examination (14th meeting). On 7th meeting, the

respondent (the student) in the experimental and control group were given questionnaire to evaluate effective learning activity. This assessment was the assessment before treatment (pretest). Treatment of implementing TQM-based learning activity was given only to the experimental group. In the end of semester, the posttest was done by both two groups. For the student in the experimental group, the questionnaire was given to evaluate TQM-based learning activity effectiveness.

12. Results

12.1 Internal Validity

Before testing of the hypothesis, internal validity of the research instrument must be tested. In the experimental research design, internal validity usually used control group to compare with the experimental group. The comparison was for both pretest and posttest. By that way, the internal validity could become stronger.

12.2 Hypothesis Testing

Hypothesis testing in this research was carried out with paired sample t-test. The testing for two paired samples carried out by comparing posttest results with pretest results for two groups, then they was analyzed to see whether the TQM application would increase learning effectiveness. Results of the paired sample t-test could be seen in the Table 2.

Table 2. Score of Paired Samples t-Test

Pair	Group	Mean	t-	Sig.	Note
1	Experimental-Posttest	2.699	3.335	0.001	Significant
	Experimental-Pretest	2.395			
2	Control-Posttest	2.296	0.642	0.522	Non significant
	Control-Pretest	2.334			

Experimental group showed difference mean between posttest and pretest results, where experimental-posttest had mean higher that was 2.6994, compared with mean from experimental-pretest that had value of 2.3949. Moreover, paired samples t-Test resulted t counted of 3.335 with the significance of 0.001, meant there was the significant difference between the experimental-posttest and the experimental-pretest. Therefore this research hypothesis was supported, meaning that the TQM application in learning activity has increased the effectiveness of learning activity.

Control group did not have a significant difference mean, both in pretest and posttest. Paired samples t test resulted t counted of 0.642 with the significance of 0.522, that there was not significant difference that was significant between the control-posttest and the control-pretest. This could happen because of control group only was has one syllabus (without applying TQM) to be applied during one semester. The function of the control group was to test internal validity (Suryabrata, 1995). Treatment effect was counted by using the following formula: Treatment effect = $[(O_2 - O_1) - (O_4 - O_3)]$

Table 3. Treatment effect (Net Effect)

Pair	Group	Mean	Treatment Effect
1	Experimental-Posttest (O_2)	2.6994	
	Experimental-Pretest (O_1)	2.3949	
$(O_2 - O_1)$		=	0.3045
2	Control-Posttest (O_4)	2.2961	
	Control-Pretest (O_3)	2.2337	
$(O_4 - O_3)$		=	0.0624
Treatment effect = $[(O_2 - O_1) - (O_4 - O_3)] =$			0.2421

In the Table 3 we could see treatment effect of 0.2421 that showed the existence of the positive influence of the application treatment (the TQM application in learning activity). This meant the learning activity has increased after the treatment (TQM application). Score 0.2421 (positive) was the pure value of treatment effect. The score was received from the difference score of posttest and pretest of experimental group that was reduced by difference score of posttest and pretest of control group. Therefore the bias effect, the effect of the history and maturation that possibly happened could be minimized.

13. Discussion and conclusion

This experimental study has shown that TQM application has improved the learning activity of the lecturers in HE at Indonesia. Learning activity is considered as an important aspect in HE. Learning or education is a core business of HE. Only, not all of HE realized the importance of continuous improvement and developing the learning quality. In the implementation of Tridharma Perguruan Tinggi, many HE did not yet pay enough attention in dharma first, that was education. They tended to second dharma (the research) and the third dharma (service to the community) that were relative more popular.

This research was the modification of Babbar research (1995). Action research in the Babbar's was developed into an experimental study with the aim of knowing definitely the treatment effect. This study used one of the designs in the experimental research, that was pretest and posttest experimental and control group design. This design needed two groups of participants, that was the experimental group and the group of the control (Sekaran, 2000). As the subject, several lecturers of Management Program of UPNVY entered an experimental group that would be given treatment and several lecturers entered the control group.

Result of the paired sample t-test showed the existence of the support for the hypothesis in this research that is the TQM application could increase the effectiveness studying-taught. For the experimental group, the significant difference happened between pretest and posttest. This could happen because for the experimental group was given two syllabuses as treatment. Two treatments in this research were before and after TQM application in learning activity. One of the limitations of this study is the application of only the paired sample t-test. This test actually is not convincing enough to provide valuable reasons explaining for the results. In this regard, future studies could look into the possibility of employing more rigorous experimental approach.

This reality gave the support for the Babbar research (1995) that did action research about the TQM application in the educational instruction of the state university in the United

States. A professor became participants in Babbar research. This professor taught three subjects that were the Production and Operation Management, Service Management, and International Operation Management. Treatment in this research was the TQM application in three subjects. Support of the hypothesis this research was also in accordance with the Gazpersz statement (2003) about the TQM application to the education system that often was acknowledged as TQM in education (TQME). TQME was expected to be able to eliminate or reduce the level of high gap between HE and the industry in Indonesia. Anyway the TQME application to HE in Indonesia might be undertaken on the basis of the understanding and joint responsibility to give priority to higher education efficiency and the increase in quality and process of HE. Through the TQME application in the HE system that was undertaken consistently through the increase in education process continually, then HE in Indonesia would won the very competitive global competition and received the economical benefit and non economical that could be utilized for this HE development and the increase in welfare of the personnel that was involved in this HE. The lecturer had responsibility to form learning for the student and is the leader in education. If in the business had the transformational leader, in education HE had the transformational lecturer that could do more than the description of his task. The task of the lecturer did not just send information and knowledge, but might be able to mobilize resources, influenced and motivated the student. A TQM-oriented approach could help the lecturer to reach all that (Babbar, 1995).

The system improvement in process management is a main element in the application of TQM. The aim was to improve the system and process by creating environment that enabled all the lecturers and the staff knew the customer requirement and carried out the task as efficiently as possible. The development of the lecturer is the vital matter to guarantee all the lecturers continued to be able to explain theories and the methodology of new teaching. The employee's staff might be also given by education to more efficient undertook the task in accordance with their respective position. All of member of HE organization needed the training of concept, equipment and TQM techniques to help them to know the role and responsibility in an effort to the continuous improvement.

Generally this research supports the hypothesis that the TQM application could increase learning effectiveness. The TQM application as treatment had positive effect to increase learning activity. The student evaluation about learning effectiveness and various instructional attributes showed results that were higher after the existence of the application of TQM. In the environment that supported each other, the lecturer and the employee would more be involved in the missing formation and monitoring, the objective and the strategic direction of HE. Human resources development is hoped to give real contribution for the organization that applied the TQM concept. However the co-operation and the support from each organization member is not an easy thing to happen. So it needs commitment and patience. Everyone in all levels of the organization might realize that teamwork needed communication continually. A leader who realized the need of cultural change would succeed in experiencing the cultural transformation.

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